WHAT IS CLAIMED IS:

1. A method comprising the steps of:

(a) providing a first optical fiber having dispersion;

(b) supplying an optical signal to said first optical fiber so that said optical signal is compressed on the time axis as propagating in said first optical fiber; and

(c) supplying a compressed optical signal output from said first optical fiber to an optical device having a saturated gain.

2. A method according to claim 1, further comprising the step of supplying an optical signal output from said optical device to a second optical fiber.

3. A method according to claim 1, further comprising the steps of:

providing at least one optical amplifier along said first optical fiber; and

adjusting the peak power of said compressed optical signal so that the peak power becomes higher than a threshold power giving said saturated gain.

4. A method according to claim 1, wherein:

the dispersion of said first optical fiber is normal dispersion; and

said step (b) includes the step of performing prechirping so that said optical signal has down-chirp.

5. A method according to claim 1, wherein:

the dispersion of said first optical fiber is anomalous dispersion; and

said step (b) includes the step of performing prechirping so that said optical signal has up-chirp.

6. A method according to claim 1, wherein said step (b) includes the step of suitably setting the dispersion of said first optical fiber and the power of said optical signal.

7. A method according to claim 1, further comprising the step of providing a dispersion compensator for compensating the dispersion of said first optical fiber along said first optical fiber.

8. A method according to claim 2, further comprising the step of providing a dispersion compensator for compensating the dispersion of said second optical fiber along said second optical fiber.

9. A method according to claim 1, further comprising the step of providing an optical phase conjugator in the vicinity of a point where the dispersion of said first optical fiber is substantially equally divided.

10. A method according to claim 2, further comprising

the step of providing an optical phase conjugator in the vicinity of a point where the dispersion of said second optical fiber is substantially equally divided.

11. An optical device to which an optical signal compressed on the time axis as propagating in an optical fiber is supplied, comprising a semiconductor optical amplifier for applying a gain saturated in concert with an increase in input power to said optical signal.

12. An optical device according to claim 11, further comprising a light source for supplying assist light having a wavelength different from the wavelength of said optical signal to said semiconductor optical amplifier.

13. An optical device to which an optical signal compressed on the time axis as propagating in an optical fiber is supplied, comprising:

a distributed feedback (DFB) laser; and

a circuit for supplying a current to said DFB laser so that said DFB laser oscillates at a first wavelength;

said optical signal having a second wavelength different from said first wavelength, whereby said DFB laser applies a gain saturated in concert with an increase in input power to said optical signal.

14. An optical device according to claim 13, further comprising a light source for supplying assist light

having a third wavelength different from said first wavelength to said DFB laser.

15. A system comprising:

an optical transmitter for outputting an optical signal;

a first optical fiber provided so that said optical signal is compressed on the time axis as propagating in said first optical fiber; and

an optical device to which a compressed optical signal output from said first optical fiber is supplied, said optical device having a saturated gain.

16. A system according to claim 15, further comprising a second optical fiber to which an optical signal output from said optical device is supplied.

17. A system according to claim 15, wherein said optical device comprises a semiconductor optical amplifier for applying a gain saturated in concert with an increase in input power to said optical signal.

18. A system according to claim 17, wherein said optical device further comprises a light source for supplying assist light having a wavelength different from the wavelength of said optical signal to said semiconductor optical amplifier.

19. A system according to claim 15, wherein:

said optical device comprises a distributed feedback (DFB) laser and a circuit for supplying a current to said DFB laser so that said DFB laser oscillates at a first wavelength;

said optical signal having a second wavelength different from said first wavelength, whereby said DFB laser applies a gain saturated in concert with an increase in input power to said optical signal.

20. A system according to claim 19, wherein said optical device further comprises a light source for supplying assist light having a third wavelength different from said first wavelength to said DFB laser.

21. A system according to claim 15, further comprising at least one optical amplifier provided along said first optical fiber;

the peak power of said compressed optical signal being set so as to become higher than a threshold power giving said saturated gain.

22. A system according to claim 15, wherein:

said first optical fiber has normal dispersion; and

said optical transmitter includes means for performing prechirping so that said optical signal has down-chirp.

23. A system according to claim 15, wherein:

said first optical fiber has anomalous dispersion; and

said optical transmitter includes means for performing prechirping so that said optical signal has up-chirp.

24. A system according to claim 15, further comprising a dispersion compensator provided along said first optical fiber for compensating the dispersion of said first optical fiber.

25. A system according to claim 16, further comprising a dispersion compensator provided along said second optical fiber for compensating the dispersion of said second optical fiber.

26. A system according to claim 15, further comprising an optical phase conjugator provided in the vicinity of a point where the dispersion of said first optical fiber is substantially equally divided.

27. A system according to claim 16, further comprising an optical phase conjugator provided in the vicinity of a point where the dispersion of said second optical fiber is substantially equally divided.